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Preface

# The Golgi complex

The Golgi complex is a good starting point to understand the organisation of the eukaryotic cell. It is at the centre of membrane trafficking, which represents a huge processing and distribution system for a large number, and variety of, proteins and lipids. Through this system, the Golgi controls the size and composition, and hence the identity and function, of most of the intracellular organelles. It receives and delivers membrane and protein cargo to and from the endocytic and secretory stations. It also contains a large number of molecules that are apparently not connected with trafficking, such as signalling and cell-cycle-related proteins, which indicates a role for the Golgi complex in the coordination of membrane transport with other cellular activities.

Perhaps because of these multiple and complex functions, or maybe because of the daunting technological and conceptual challenges it continues to pose to investigators, or even through its place at the historic core of cell biology, the Golgi complex has generated endless fascination and debate. Recently, a number of technologies have emerged that taken together might be sufficiently powerful to address the remaining enigmas of the Golgi complex, including organellar proteomics, high-throughput microscopy for gene screening, super-resolution light microscopy, correlative video-electron microscopy, and electron tomography.

This is, therefore, a good time for us to assess the state of the Golgi field. Given its vastness, we have not tried to be comprehensive here. We have chosen a few topics, some traditional, and some novel but likely to become central in the near future, that appeal to us as being particularly relevant at this stage. These include the roles of the Golgi complex in mitosis, cell signalling, and animal development, as well as a few novel aspects of different stages and machineries of Golgi-related trafficking. Two of these reviews are aimed at providing perspective, one for the history of the discovery of the Golgi complex and of its morphology and function, and one for the role of the Golgi complex in eukaryotic evolution.

As said above, we believe there is more to the Golgi complex than the Golgi stack. As such, we believe that we have here provided what will be a good read both for Golgi insiders and for people looking at the Golgi complex from other research areas.

Maria Antonietta De Matteis
*Consorzio Mario Negri Sud,*
*Via Nazionale 8/A, S. Maria Imbaro (Chieti),*
*66030, Italy*

*Telethon Institute of Genetics and Medicine,*
*Via Pietro Castellino 111,*
*80131 Napoli, Italy*
*E-mail address:* dematteis@tigem.it

Daniela Corda
*Consorzio Mario Negri Sud,*
*Via Nazionale 8/A,*
*S. Maria Imbaro (Chieti),*
*66030, Italy*

*Institute of Protein Biochemistry,*
*National Research Council,*
*Via Pietro Castellino 111,*
*80131 Napoli, Italy*

Alberto Luini
*Consorzio Mario Negri Sud,*
*Via Nazionale 8/A,*
*S. Maria Imbaro (Chieti),*
*66030, Italy*

*Telethon Institute of Genetics and Medicine,*
*Via Pietro Castellino 111,*
*80131 Napoli, Italy*


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